TREES
Magazine

A Modern Highway in Massachusetts

Third Southern Shade Tree Conference—Gainesville, February 22-24

THE NATIONAL ROADSIDE PROGRAM—*Wilbur H. Simonson*

ROADSIDE PARK DEVELOPMENT—*Jac L. Gubbels*

January, 1940 HIGHWAY DEVELOPMENT NUMBER 25 Cents

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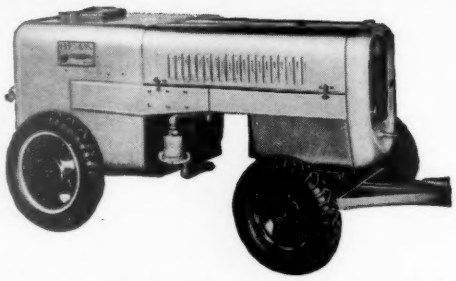

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ALONG THE WAY

■ Who has moved the largest concolor fir on record? W. F. ABBOTT, OF WELLS, MAINE, gives the following figures on one he moved recently: 42 ft. high, 20 ft. spread, 21 in. diameter, 9 ft. ball by 3 ft. 6 in. deep. Total moving weight, 34,000 lbs. Sorry we can't use the fine pictures this time, but maybe we'll get a bunch of "biggests" and "bests" and we'll run a page of them.

* * *

■ *J. A. HOYT, OF CHICAGO, ILLINOIS, in renewing his sub to TREES, came up with a "chestinflator"—"My thanks to you for again calling my attention to TREES; I would never pass it up, as I consider your publication of great value to every individual engaged in the business of tree preservation." We appreciate those kind words.*

* * *

■ RAY PAGE out at the BEVERLY HILLS NURSERY (Calif.) has the most striking block of LIQUIDAMBERS you'd ever want to see. The foliage has just turned and is A DEEP VIVID SCARLET. What a STREET or ORNAMENTAL TREE!

* * *

■ *DOCS CHADWICK and TILFORD recently paid their respects to Kent, Ohio, the home of the DAVEY TREE EXPERT COMPANY, for the first time. Hope WES HOLLISTER and "RED" JACOBS took them out to see the famous SEQUOIA GIGANTEA. How's it doing, anyway, boys?*

* * *

■ BOB CUNNINGHAM, way down south in SHREVEPORT, LA., tells us of the beautification program there. They are flooding the town with REDBUDS (*Cercis Canadensis.*) That's a REAL CONSTRUCTIVE CIVIC PROGRAM and is bound to pay dividends by drawing people to see this grand display of beauty.

* * *

■ *What's all this about WALTER KIPLINGER, the MARSHALL, MICHIGAN, METEOR, inciting a riot over "yellow boiler onions" and demanding the Marines be set on his trail. Look out for THOSE MARINES, WALTER! You know what they did at Chateau Thierry!*

* * *

■ Poor OLD TOOTHLESS DON HUSE! To hear him berate himself you'd think he was ready for the bone orchard. But I still WANT TO SEE that horse chestnut across the MUDDY DETROIT RIVER. It can't be as large as your brag!

* * *

■ The SOUTHERN SHADE TREE CONFERENCE holds forth in GAINESVILLE, FLA., February 22-24, and DOC NEWINS is looking for a good crowd. FLORIDA IS ALMOST as nice a place as CALIFORNIA in the winter, boys, so get going!

* * *

■ *DR. C. J. HUMPHREY, our new columnist, conducts a fine consulting laboratory at 543 La Cienega Boulevard in Los Angeles. You park and tree men who run into "toughies" along the plant disease line, should give Doc a buzz. You won't have to mortgage the city hall, either.*

* * *

The Cover Picture . . . We are indebted to John V. McManmon, Director of Roadside Development for Massachusetts Highway Department, for the excellent cover picture. It shows a divided type of highway—specifically, it is Route 128.

■ Well, blow me down! DOC BURKE (H. E.) has gone agricultural on us and is now a farmer at Los Gatos. He'll be at the WESTERN SHADE TREE CONFERENCE IN MAY, but in the meantime his address is Route 3, Box 97A, Los Gatos, Calif.

* * *

■ *Hope the arrangements committee for the 16TH NATIONAL SHADE TREE CONFERENCE in DETROIT is doing some fancy arranging. I'll never forget a night in Detroit when a bunch of us had gone there to celebrate with a friend who was to be married the next day. He was at the wedding, all right. GREAT TOWN, DETROIT—BEAUTIFUL TREES.*

* * *

■ W. E. ROSE, forester of Hinsdale, Ill., sends a nice book of the proceedings of the last sessions of the MIDWEST INSTITUTE OF PARK EXECUTIVES. Some very worthwhile papers are contained and we hope to run several for you. Hope some of your members respond to the nice curtain call you gave "Trees." Gracias.

* * *

■ *Three new National Forests have been established since last September. The Mark Twain and Clark National Forests in Missouri, and the Shanee in Southern Illinois.*

* * *

■ Very soon now, well in Spring, I will realize a long dormant ambition; will see one of my "raves" blossom into reality. The LOS ANGELES PARK DEPARTMENT is to plant a street or two of coral trees (*Erythrina caffra*) this spring. Glory hallelujah! Two years ago I gave FRED ROEWEKAMP three or four hundred seed of this spectacular winter blooming beauty and now they are ready. This will be a sensation. More reports later.

* * *

■ *Too bad the annual conferences of the NATIONAL SHADE TREE CONFERENCE and that of the AMERICAN INSTITUTE OF PARK EXECUTIVES are not held closer together. Should be no more than a week apart.*

* * *

■ We sure get kicked in the chin on this Canadian exchange. Nineteen cents on a buck. THIS MUST BE DONE SOMETHING ABOUT! RESTORE WORLD SANITY, MAYBE!

16TH NATIONAL SHADE TREE CONFERENCE

Book Cadillac Hotel
Detroit, Michigan
August 27, 28, 29 and 30, 1940
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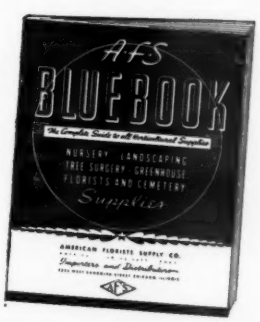

January, 1940 A QUARTERLY JOURNAL Volume 3 — No. 1

EDWARD H. SCANLON, Editor and Publisher

"No place is complete without trees. A home without trees is charmless; a road without trees is shadeless; a park without trees is purposeless; *a country without trees is hopeless*"

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CORDIALLY YOURS

EVERY STRUCTURE HAS A CORNERSTONE

There is a definite need at this stage in the development of the profession of Arboriculture for an authoritative, basic manual.

There have been many sins committed under the guise of tree surgery; as a matter of fact, the sins have very nearly led to a campaign of ridicule, which as any intelligent man knows, is fatal.

Leadership fortunately has been in the hands of serious, high-minded men whose unselfish titanic efforts in behalf of conscientious scientific application of the precepts of proven tree preservation methods have averted a drastic swing to the left; however, the fight has been a long and expensive one—also, perhaps to individuals, a thankless one.

So then in the face of existing conditions a cornerstone around, and upon which a fine structure can be built, is definitely the next rung of the ladder. The manual which should be this cornerstone must be all inclusive, based on modern approved tree preservation practices in all sections of the country and if there are foreign departures from American procedure, they should be considered and recorded.

Obviously this is not a one man job. It must be edited by an impartial "Judge Landis" or supreme court from material supplied by acknowledged leaders and savants.

To cover all phases of this far-reaching profession it will be necessary to have the wholehearted cooperation of such societies as the American Institute of Park Executives, American Society of Landscape Architects, Society of American Foresters, National Shade Tree Conference and the Western Shade Tree Conference.

A manual of this nature would eliminate the dissemination of much unsound counsel which often emanates from small agencies, of various nature, throughout the country. This type of information with the stamp of what the layman has every right to believe to be authority, is difficult or impossible for the informed, but individual, Arborist to correct. Also it would serve to convey to some of the less well-informed gentry of the profession the plethora of sciences and manual ability one must have an acquaintance with before he should be turned loose on the public. That is to those of the butchers who can read.

We would like to have some opinions from the readers and we ask that they express themselves freely so that a start may be made.

ARE YOU A GOOD MEMBER?

Being a good member of an organization does not necessarily mean that you pay your dues each year and attend meet-

ings regularly. That you do pay your dues and attend meetings does mean that you are not merely a "joiner"—one who joins everything just to fill up a purse with membership cards.

We know that every member of an organization cannot be a leader or the president, but you don't have to be merely one who "came along for the ride"—you can be an important member *by going out and bringing in one, two or five new members each year.* This would be a real accomplishment and if our park and tree organizations expect to get anywhere, some effort should be expended along the line of an enlarged membership.

Why is it that a recreation conference will attract nearly 2,500 people while an important tree or park conference will do well to muster one-fifth of that total? This is not nearly as prosaic as it sounds.

Better think it over and see just how good a member you are—then do something about it—don't "let George do it" because maybe George has done his share. There are entirely too many shirkers in our organizations and not enough unselfish, intestinally fortified people with the intellect to recognize that the bigger and stronger is his organization, then the more far-reaching and successful will its purpose be felt. And if you want to get right down to dollars and cents, there will be more of those for you, too—but, in the end, if you are motivated by the desire to see your organization grow so that it will contribute its share toward making the world a little bit of a better and easier place for the next fellow to live in, then you will be a *good* member.

SPLENDID COOPERATION

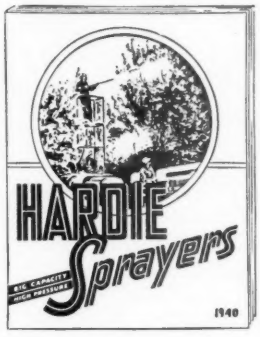
We certainly were caught in an avalanche of pictures, data and unselfish cooperation when we launched the request for material from State Landscape Engineers for this Highway Development issue.

To use it all we would have to devote the remaining issues of the year; this is not possible of course, but from time to time a place for it will be found.

We heartily thank the many good friends who are doing such a splendid job of "beautifying" American highways and assure them that this issue will be, at least, a yearly event, and we ask if they will begin gathering tree data for the next issue.

ADVANCED ENGINEERING FEATURES NEW SPRAYERS

The latest development of high pressure sprayers for application of spray liquids to shade trees, is interestingly shown in the new 66-page 1940 catalog of The Hardie Mfg. Company, of Hudson, Mich., just off the press.



The book illustrates and describes power sprayers ranging in size from four gallons per minute at 300 lbs. pressure to 80 gallons per minute at 1000 lbs. pressure. Tractor powered outfits, motor truck mounted sprayers with and without power take-off, engine-equipped sprayers and stationary spraying plants are shown in full detail.

International use of Hardie Sprayers is revealed in interesting pictures of cotton spraying in South America, and spraying of banana plants on the big plantations in Central America. Unique outfits for the large commercial grower of field crops are the specially engineered high clearance sprayer for gladoli plants and the motor truck mounted vegetable sprayer with 32-foot boom. Copies of the catalog may be had by writing to the company's offices at Hudson, Michigan, Portland, Oregon, Los Angeles, Calif., or to the Export Office in Detroit, Mich.

ODDITREES

Standing alone but very proudly, the "Candelabrum Tree" in the Southern California High Sierras is truly an "Odditree."

With its four distinctive spire leaders reaching far into the blue skies of the Sierras, the "Candelabrum Tree" excites much curiosity and admiration from travelers. The tree is a Big-Cone Spruce (*Pseudotsuga macrocarpa*) and is located a few feet below the highway one and three-tenths miles west of Deer Springs public camp.

Carl O. Gerhardy, Assistant Forester of the Los Angeles County Forestry Department, who sent in this interesting "odditree," has taken the following measurements: D.B.H., 3.2 ft; height, 75 ft; and it is estimated to be 250 years old, although he was unable to secure an increment core into the heart.

Carl calls attention to the several dead branches which persist on several of the leaders, indicating the ravages of the red demon at some time past. Resistance to fire is a quality of the Big-Cone Spruce and in this respect surpasses all other Southern California coniferous species.

Photo courtesy O. Philip Meanf

The thought advanced that the tree might be a mutant seems unlikely; in all probability the distinctive feature of four leaders is the result of fire or lightning injury.

"SIMPLE" PRUNING

Who authored the misleading, uninformed article "Shade Tree Pruning Simple" in the November 1939 issue of Your Garden, a publication of the Los Angeles Bureau of Water Works and Supply?

It states, "Pruning of ornamental shade trees is possibly one of the simplest of all jobs in pruning—because a general rule will apply to all varieties of trees." Verily, an expert has spoken.

Further words of "wisdom" to the poor public follow: "In practically all trees the branches gradually become lower, or 'come down,' due to the increased leaf weight; these should be cut off rather than have a prop put under them . . ." and so on.

This is an example of information put out for public consumption from a source that to all intents is qualified. More than ever is a "Manual on Arboricultural Practices" needed.—E.H.S.

Roadside Park Development

By JAC L. GUBBELS
Head, Roadside Development
State Highway Dept.
Austin, Texas

Roadside parks are most valuable and desirable; in fact, they have become practically a necessity. A personal background of some of my traveling experiences will show why I believe this to be true. My earlier years were spent in European countries where we traveled extensively. When we planned a trip there was, of course, a point of destination in mind. Reaching this destination, however, was not the greatest anticipated joy. We derived our greatest pleasure from the interesting and delightful gardens that we were to see along the route.

After coming to this country I learned that in the pioneer days "postas," which in Spanish means a place of retirement, were located along the old trails in Texas. Here the horses of the stage coach were exchanged for fresh teams, and the passengers had a chance to get out of the coach, stretch themselves and relax. Today the methods of travel have changed, and the stage coach stands or "postas" have disappeared.

The automobile has replaced the stage coach, and now an automobile can travel at least 200 miles without stopping for gasoline. This distance is too great without something of interest along the route for the motorist to look forward to with joyful anticipation, especially when tours of longer distances are planned. To me a roadside park can be to the modern traveler what the inns were to the Europeans, or the "postas" were to the pioneers.

CONVENIENCE

In this state we are providing roadside parks for the use of the traveling public. We are not concerned primarily with how many people use the parks, but we are concerned if there are enough parks provided. Roadside parks along the highway relieve the mental strain of the motorist. He knows that he is not compelled to stay on the highway for long periods, but can drive into any of the parks when he so desires. If traveling with children, the parks offer clean, well maintained areas where the children may get out and burn up their accumulated energy without endangering their lives by heavy traffic.

SAFETY

In modern travel there are many monotonous things which cause the driver to lose interest in driving. The constant humming of the tires on the pavement, the rhythmic drone of the motor, the focusing lines of the highway, and the whistling of the wind tend to hypnotize the driver, and his mind begins to wander. He becomes inattentive and is not capable of meeting traffic emergencies. The installation of roadside parks serves as an oasis to drivers, and a few minutes spent in the park will relieve any mental fatigue and drowsiness. For safety, we

Photo courtesy Texas Highway Department
Roadside Park with Picnic Tables

can have hardly enough of these inviting, friendly spots. Even though our mechanical age has reached a high peak, there are still times when something goes wrong with the automobile and it is necessary to stop. Here again the roadside parks are a welcome sight, for no one wishes to be stopped on a heavy traveled highway.

LOCATION

Speaking of safety leads us direct to the location of roadside parks. As the parks are provided to promote safety, then it is important that their location be such that the park traffic will not create a hazard where it enters the roadway. There should be sufficient sight distance approaching the roadside parks so that both highway and park traffic will have a clear vision of each other. A sufficient sight distance also gives a driver time to slow down before entering the park area.

Ideal locations are those with long frontages paralleling the highway, which offer fine trees for shade, open vistas, panoramic views, river banks, lake shores or any other unusual feature which is friendly and inviting.

For the stimulation of the motorist's interest, unique and attractive signs giving the distance to the next roadside park are placed along the highway.

DEVELOPMENT

From experience in this state we have found that elaborate developments are not necessary or desirable. The motorist is well pleased with the park if it is provided with good drives, adequate parking areas, fireplaces, tables and benches. All picnic facilities have been constructed of materials native to the vicinity, and of a simple, stable design.

Rest rooms and drinking fountains were found to be impractical since all major filling stations offer such facilities to the motorist in much better sanitary conditions than the Highway Department could attain. In the beginning of our work, playground equipment was provided in a few of the parks; however, they were found to be unnecessary, and more often liabilities. By keeping the park developments simple, maintenance has been reduced to a minimum.

PRESERVATION

Often where there are new highway locations, property owners have a tendency to clear and grub their adjacent farm land, destroying trees which could add greatly to the appearance of the finished highway. The wooded areas, if secured along with the right-of-way, could be developed into roadside parks, thus preserving the natural plant life which adds to the vertical lines so necessary to break the monotonous horizontal lines of a highway.

The planting of wild flowers and other native plants within, and in the vicinity of the roadside parks, gives the public an incentive to learn more about them. This alone will aid in conserving native plants which are of such great value to any country.

APPRECIATION

Our files are full of unsolicited letters from people all over the nation expressing their appreciation of the Texas roadside parks. The fact that we now have over 400 parks, all of which have been donated to the Highway Department, is sufficient proof that the public is heartily in favor of this work.

The National Roadside Program

By WILBUR H. SIMONSON
Senion Landscape Architect
Division of Design
Public Roads Administration
Washington, D. C.

The 1939 report of the Public Roads Administration was issued early in December. A few highlights pertinent to roadside development may be of interest to readers of TREES Magazine.

The record of new roads built and roads improved during the year, and of grade crossing eliminations and protection of crossings, is impressive.

More than 17,000 miles of main highways and nearly 3,000 miles of secondary roads were completed during the past fiscal year in the program administered by the Public Roads Administration, according to its annual report released last month. This does not include National Park and National Forest road construction.

Outstanding in the program was the large amount of work done in widening, straightening and modernizing important main highways. Most of the work was done in cooperation with the State Highway Departments, about 13,500 miles, including 9,800 miles on rural portions of the Federal Aid system.

This high rate of progress in highway construction reveals the potentialities of roadside development as a part of this continuing cooperative program. Quoting from the Report:

"Roadside improvement had its beginning in a small way many years ago but it received only slight impetus until the initiation of the emergency program of highway improvement in 1933. Since that time it has been mandatory that roadside improvement work be included in Federal-aid programs.

"Six years of experience with roadside improvement have demonstrated that in building a properly conceived highway the road surface and the roadside cannot be treated separately but must be regarded as a single problem. Consideration of the roadside and the recreational use of highways are responsible for several trends that are becoming increasingly evident. Wider rights-of-way are being obtained; deep ditches have disappeared; wider shoulders are being used; slopes are flatter, more rounded, and planted to grass; footpaths are being built; and picnic areas and parking space at scenic views are now included in highway plans.

"Increased attention is being given to roadside regulation and border control. Easements are being obtained to permit improvements beyond the limits of restricted rights-of-way. Rural zoning regulations are being adopted. Many of these specify the distance which buildings and billboards shall be set back from the highway."

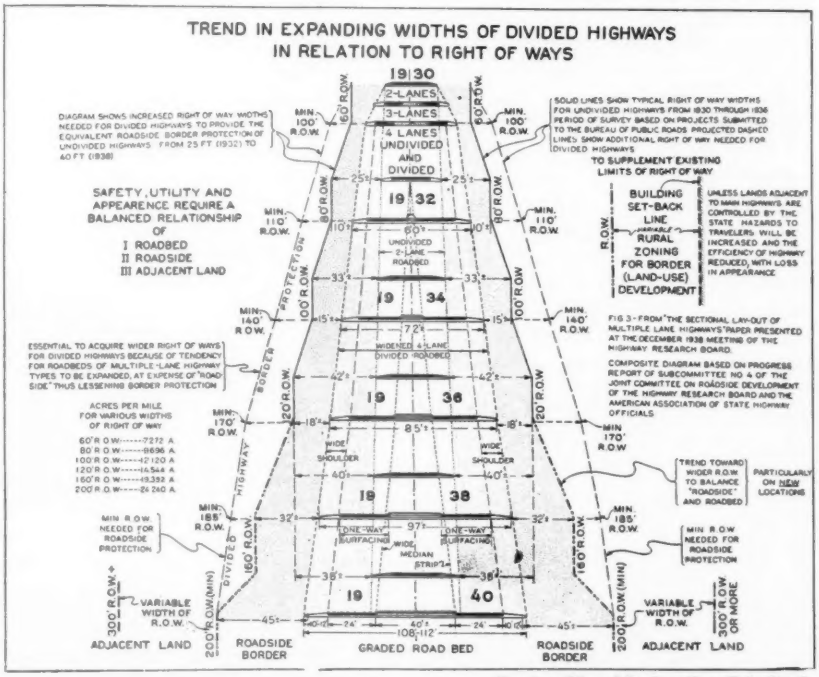
Active research in many fields of activity having to do with roads was reported also at the Annual Meeting of the Highway Research Board held in Washington, D. C., early in December, 1939. The fact that much of this research is rapidly being worked into design and construction planning is indicative of its value. The Committees on Roadside Development have been making constructive progress in the study of their problems in relation to soil erosion control, landscape grading of highway cross-sections, esthetics in highway location, plant ecology, economics in both construction and maintenance, zoning and public relations.

Active discussion developed at the committee meeting on roadside development as to the best procedure in using zoning to prevent encroachment of commercial activities on highways. The subcommittee on zoning supported general county zoning, with highways as only one feature and described a successful application in Wisconsin. The general feeling, however, was that this method was very slow in getting results and that an immediate start can be made on zoning a strip of land along major highways. Legislation is the key to this fundamental question and the education of the public is the means of turning that key for effective protection of highway borders.

The diagram accompanying this article presents to the reader the fundamental need for adequate widths of right-of-way as the foundation structure upon which to build tomorrow's more efficient and safer highway. It will be observed that greater emphasis is being given the roadside area for the essential border protection, supplemented wherever possible by building set-back lines and rural regulations for land-use development. Unless lands adjacent to main highways are controlled by the State, hazards to travelers will be increased and the efficiency of highways reduced, with loss in appearance. Safety, utility and appearance require a balanced relationship of roadbed, roadside and adjacent land, and unless roadside borders are adequate in width, the planting of trees along important highways is greatly restricted and frequently open to question in the competition for necessary growing space.

The handicaps of present day conditions along highways will be solved when

(*Continued on page* 14)



Courtesy Div. of Design, Bur. Pub. Roads

Landscaping Divided Highways

By JOHN V. MCMANMON
Director, Roadside Development
State Highway Department
Boston, Mass.

There are various schools of thought on this subject and one which deals directly with the highway involved. It is a known fact that the divided highway is the safest and most enjoyable to the motorist. If this is to be one of the most important highways, it should have all the features necessary to make its use comfortable and safe. If this type of highway is to be landscaped properly, early consideration must be given to the landscape features which are essential to the safety and comfort of the motorist.

We must, therefore, start with the right-of-way. This must be adequate to support the traffic flow and the investment made by the State. This type of design must not detract in any way the values, either scenic or otherwise, of the community. There is no definite right-of-way that can be made as a standard. The right-of-way should be determined by the particular section the highway is going through. Enough right-of-way should be taken to allow for economical construction to serve the needs for the next twenty-five years.

The features to be considered and placed in the original design are as follows:

A right-of-way should be of sufficient width at the outset to include a fairly wide neutral ground and have side space for development work, particularly proper back sloping.

The proper cross-section may be divided as follows: the road bed, roadside and adjacent lands. These zones are the fundamental factors for proper roadside development and include erosion, zoning, public relations and economics. We cannot overlook the road bed if we are to allow for proper drainage and the safety of the motorist. It is impossible to overlook the adjacent lands when we are trying to blend the roadsides into the existing topography. If we are to make an investment in divided highways we must have control of the roadside or the purpose of this type of design, which is to carry traffic with the least inconvenience, is defeated.

If we give the proper consideration to the factors mentioned, we can then proceed to landscape the highway. The median strip should be wide with simple landscape treatment of permanent ground cover that will not be too costly to maintain. At certain intervals, group plantings may be placed to frame bridges or to bring out some scenic effect in the landscape. The wider the median strip, the more satisfactory the landscape work can be brought out. Where the median strip is to be constructed, an edging of some type should be placed to make it evident that there is a median strip and also something for the motorist to sight.

Photo by Patterson
The World-Famous "Redwood Highway" in California. A standard width road dwarfed by 300 ft. Redwoods

Photo courtesy Massachusetts Highway Dept.
Ground Cover in Center Strip of Saugus-Newburyport Pike, Rt. 1, Massachusetts

Slope curbing is much safer for the motorist and blends in well with any grading that might be done behind it.

The actual planting should be simple in design but at cross-overs or bridges, groups of shrubs and some trees can be used to bring out these facts to the motorist. Trees in the center plot are not desirable if they are planted to give the appearance of an avenue planting. The extent that trees will be used in the design will depend entirely upon the width of the median strip. Median strips under 20 feet should not be considered as the proper location for trees. When they are planted in narrow plots, they require a continued maintenance cost. Some of the shrubs that tend to grow as a ground cover will make a pleasant variation in the median strip. Islands and inter-section triangles should have a full cover of low growing plant material that will not grow over three feet in height. The plants best suited for this type of ground cover would be the vines or low shrubs. Many of the shrubs can be used on the roadsides to reduce any artificial cut that might have been made by the construction of the highway. The shrubs can be used with care in the median strip by placing them in informal groups to break up the monotony of the ground cover used where mileage is a factor.

The roadside is the proper place for tree planting, and enough roadside should be available to allow the proper grading and slope construction to take place. Trees may be planted in groups to bring out various foliage effects and they should be far enough away from the hardened surface to allow for future growth. It is along the roadside where we can make our planting blend into the existing growth by the proper selection of trees and shrubs. Two or three varieties, as indicated by the natural growth, can be used in combination. For example, birthes, in clumps with pines, make a very natural combination where they exist along the roadsides. The oaks and hemlocks make a good combination along a forest area, with a few of the lower growing flowering trees, such as the dogwoods. The flowers have a background to display themselves upon. The dogwood has a flat flowering habit and needs some foliage to bring out its gracefulness.

The slopes should be planted to low growing material in colonies to give the appearance of their natural habit. This

(*Continued on page* 18)

Maintenance of Highway Trees

By JOHN L. WRIGHT
Director, Roadside Development
State Highway Dept.
Hartford, Conn.

All highway landscape engineers are fully aware of the importance of shade trees in the development of roadsides. They not only introduce trees in their development plans but strive to conserve and maintain as far as possible all desirable existing trees.

The maintenance of highway shade trees requires careful attention if the best results are to be attained. The necessity of competent trained personnel to direct the operations and skilled tree men to carry on the work are requisites which must not be overlooked.

For years the larger cities, towns and some counties throughout the country have carried on excellent shade tree maintenance programs. Invariably this work has been wisely planned under the direction of skilled arborists and executed by trained tree crews, employing the most up to date improved methods. Much credit is due these men for the quality of their work and the results they have obtained. However, until recent years, little thought was given to the value of the trees along our state highways. Dead trees and branches were only removed when they became extremely hazardous to the traveling public. Invariably this work was performed by men unskilled in tree work and ignorant of the possible damage that might result from their operations.

Happily, the true importance of systematic care of shade trees along the state highways is now fully realized. Every highway department in the country is organized to properly carry on this essential work. In most instances men trained in proper shade tree maintenance are in direct charge of the projects. There are numerous highway departments which are caring for the trees with their own trained crews stationed permanently in allotted districts and caring for only such trees as come within their districts. In other states roving crews of four or five men are employed to look after whatever emergency tree work may arise in any part of the state. These crews are usually augmented by tree expert firms who are engaged to carry on the major portion of the systematic tree maintenance. In still other states the entire work is placed in the hands of tree expert companies, the department's personnel consisting only of a sufficient number of trained inspectors to adequately supervise the contracts. The most economical method in carrying on satisfactory shade tree maintenance is dependent largely on local conditions such as departmental policies, availability of skilled tree workers and prevailing wage scales.

Any well-rounded highway shade tree program is comprised of multiple functions. As in every other highway operation, it must be carried on in such a manner as to insure utmost safety to the traveling public as well as to the employes performing the work. Economy of operation, too, is of great importance in the expenditure of public funds. In addition the aesthetic and recreational values of the work must be considered as far as possible.

There are innumerable trees along all highways which are constantly in need of pruning. Dead and dangerous branches have to be removed and low-drooping limbs cut back to insure clear vision and unimpeded passage to the motorist. Frequently trees are encountered with weakened limbs and split crotches which are deemed worthy of conserving. These must be properly bolted and cabled.

Many of our trees, especially in urban areas, are unsuitably located for successful growth. Increased traffic has necessitated the widening of the pavements with the resultant narrowing of the tree belts between the pavement edges and the sidewalks. Such trees often respond remarkably well when carefully fertilized.

There are annually hundreds of trees which die along highway systems throughout the country in addition to untold numbers which have outlived their usefulness. The task of removing these trees falls to the tree maintenance crews.

The ever increasing hosts of tree insects and diseases make it imperative to includ a comprehensive spray schedule in the shade tree maintenance program. Adequate spray equipment with thorough and timely spray applications are essential to success.

Major tree surgery operations are in general too costly to be considered. However, specimen trees of historical value are usually given whatever treatments are thought necessary to prolong their health and beauty. Frequently minor tree surgery is practiced involving treatment of superficial open cavities and bark tracings. Many times these operations can be carried out at small cost and with definite success.

Tree planting is a function of every roadside development organization. The care of these newly planted trees in many instances is the responsibility of the shade tree maintenance crews. Adequate staking, guying, mulching, spraying and watering these newly planted trees, to insure their successful establishment, is generally accepted as good practice.

In addition close supervision of Public Utility companies' line clearance operations is indispensable to the health and attractiveness of our highway trees. Indiscriminate slashing of interfering trees, so common but a few years ago, is no longer tolerated. The companies are cooperating splendidly. They are employnig skilled tree crews to carefully do such pruning as is necessary and are using careful engineering skill in laying out their lines.

It is indeed a satisfaction to know that throughout the country it has wisely become the policy of the highway departments to recognize the value of their shade trees and to adequately provide for their maintenance. These trees are grateful for the care they receive and will respond with added usefulness and beauty to the roadsides.

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Developers of America

Harold E. Olson
Engineer of Roadside Development
Dept. of Highways
Minnesota

On a roadside development project on the Minneapolis Belt Line being constructed along the west limits of Minneapolis, a considerable number of large oak, elm and maple trees ranging from four inches to ten inches in caliper were within the construction limits. In order to save and transplant these trees, the Project Engineer, Mr. Carl Graeser, designed a tree wagon which was successfully used in the preservation of 350 trees.

We have had a loss of less than five per cent in two years on these transplanted trees and have had an immediate effect, wherever this material was used.

Franklin T. Rose
Landscape Architect
State Highway Commission
Kansas

SAVING NATIVE GROWTH ALONG KANSAS HIGHWAYS

Thousands of volunteer trees are springing up along highways of eastern Kansas. Many of these trees can be saved through selective thinning and pruning. This conservation measure has been made possible by the Highway Maintenance forces who have discontinued the practice of annual burning of the roadsides. Additional attention is given to saving desirable shrub types and seedling trees while mowing the roadsides.

Eastern Kansas is favored by a good climate and good growing conditions. Many people who have not visited Kansas are badly misinformed about conditions here. We have had periods of severe drought, but what section of the country has not? The following data taken from the "Climatic Summary of the United States" explains why crops and forest trees do well in Eastern Kansas. "The average annual precipitation decreases from 35 inches in the northeastern counties and slightly more than 40 inches in the southeastern counties to about 25 inches at the north-south line dividing Kansas into equal parts.

"From 70 to 74 per cent of the precipitation of the eastern half of Kansas falls in the warm season of the year, April to September, inclusive, when the need of soil moisture is most urgent. It is a rather remarkable fact that no states, except a few along the gulf coast, receive as much rainfall during these six growing months as the eastern third of Kansas."

S. J. Walsh, Jr.
Landscape Engineer
Department of Highways
Washington

BROOMS AND GENISTAS

For this coastal region we have found that Brooms and Genistas are perhaps the hardiest of nursery-grown material. They can be planted in sand or gravel cuts and with little or no care produce very satisfactory growth. The Brooms also put out an excellent flower display in the spring and Spanish Broom blooms most of the summer.

We have used and obtained good results with thefollowing:

Cytisus alba (White Broom, tall).
Cytisus atropurpurea (Clover-leaf Broom, dwarf-flower, lavender, sweet-scented).
Cytisus andreanus (Red-winged Broom, tall).
Cytisus kewensis (Kew Broom, dwarf, orange yellow flower).
Cytisus praecox (Moonlight Broom, medium height, cream-colored flowers, sweet-scented).
Genista hispanica (Spanish Broom, tall, yellow flowers).

Dallas D. Dupre, Jr.
Landscape Architect
Department of Highways
Ohio

A splendid book entitled "The Preservation and Protection of Roadside Trees," is the contribution from Ohio. The foreword gives its purposes as follows: " . . . has been prepared in response to requests made by representatives of Public Utilities companies and others interested in construction projects within the right-of-way limits of the State Highways where the problem of tree preservation is involved."—*Editor's Note.*

E. W. Wendell, Jr.
State Supervisor Roadside Improvement
Division of Highways
New York

We are not carrying on the amount of tree and shrub planting that we did from 1934 to 1938, since such plantings take considerable maintenance, and our funds are limited. At this time we are concentrating on the seeding and sodding of slopes with a limited amount of tree planting.

Since this work started, we have used a great variety of trees, shrubs and vines, and have found that for highway plantings the most suitable trees are the existing types commonly found along the roadside, such as elm, oak and maple, rather than unusual or exotic varieties. For the screening of borrow pits, spoil areas and other unsightly spots, we have found that common varieties of sumac work very well, as they grow rapidly and will survive on the poor soil types usually found at such locations.

For slope plantings one of the most suitable vines is the American bittersweet. We have had very good survival and get rapid bank coverage, which is essential for satisfactory stabilization. The bittersweet also presents a pleasing appearance, and such slope plantings have been very satisfactory.

Ronald McGillivray
Landscape Engineer
State Highway Department
North Dakota

We have found the hardiest and best growing trees are the American Elm, Hackberry, Green Ash, Northwest Poplar and Chinese Elm. The Chinese Elm occasionally winter kills, however it grows very rapidly. American Linden, Catalpa trees and Walnut trees will grow successfully, however they need special care. The best evergreens are the Badlands Juniper, Ponderosa Pine and Norway Spruce. The most successful shrubs are Tartarian Honeysuckle, Cotoneaster acutifolia, Lilacs, Buckthorn, Caragana, Russian Olive, Dogwood, Sumac and Currant. Rugosa and setigera roses do well. Kentucky Blue Grass is the principal lawn grass.

Kenneth T. Brown
Landscape Engineer
State Highway Commission
Maine

COLLECTED PLANT MATERIALS FOR ROADSIDE WORK

Because nurserymen could not supply certain plant materials in quantity lots of the sizes required, the Maine State Highway Commission was forced into the collecting field three years ago in order to obtain native materials for plantings on roadside improvement projects.

The following trees, shrubs and ground covers are now extensively collected and planted with excellent results:

White Pine (*Pinus strobus*) 4'-8'.
Red Pine (*Pinus resinosa*) 4'-8'.
White Spruce (*Picea canadensis*) 4'-8'.
Common Red Oak (*Quercus rubra*) 1"-2" clpr.
Birch (*Betula in var.*) 1"-2" clpr.
Staghorn Sumac (*Rhus typhina*) 3'-4'.
Common Juniper (*Juniperus communis*) 12"-18".

Our experience conclusively proves that these materials can be successfully collected and transplanted and has many advantages in that individual plants of the desired sizes can be selected, time between digging and planting can be controlled and savings range from 300 to 900 per cent.

H. J. Schnitzius
Landscape Supervisor
State Highway Commission
Indiana

In a five year planting program of 830 miles of modern highways, Indiana has planted an average of 29 large trees; 47 small flowering trees; 3 evergreens; 720 shrubs and 601 vines per mile.

J. H. Dowling
State Highway Engineer
State Road Department
Florida

This department does not undertake planting of trees or shrubbery on our right-of-way as we do not have the facilities to properly water and give them the attention needed. We do, however, try to preserve and take care of the natural beauty by saving all trees on the state right-of-way which do not interfere with the construction of the road.

M. Walter Pesman
Landscape Architect
Highway Department
Colorado

The Colorado Blue Spruce is the State tree for the "Roof garden of the U. S. A." Many other evergreens belong ecologically to Colorado's mountainous and foothills regions. Still others, like the Pinyon Pine, carry the evergreen character down to the plains.

So it comes that Colorado can use evergreens for (some) roadside planting and make them look at home. The Ponderosa Pine has proved itself especially valuable. Mortality figures run remarkably low, usually much less than 10 per cent. And the effect is stunning.

Oakley McFerrin
Landscape Engineer
Highway Department
Alabama

We are using trees of various varieties in

erican Highways—Say

our roadside planting, to outline our curves, and other potential danger spots, such as parallel to roadway on opposite side from an intersecting road.

In many instances we are using trees of very rapid growth (Yellow Poplar, etc.) for this purpose even though these trees are rather brittle. We believe that their immediate usefulness will offset the disadvantage referred to above.

A. T. Bleck
Construction Engineer
State Highway Commission
Wisconsin

Wisconsin is one of the northern states of our country where snow removal and drift prevention are quite a factor in keeping the roads open to travel throughout the year. Several years ago a few living snow hedges were planted in selected areas adjacent to highways as a means of determining their effectiveness. Various species of conifers were used for this purpose, and a study is being made as to the practical and economic value of these hedges as compared to the wood picket barriers now in general use. In the expansion of this program additional snow hedge plantings are being made with the hope that within a few years they will bring about a saving of quite a sum annually as well as improve the appearance of areas adjacent to our highways.

George H. Otten
Landscape Engineer
State Highway Commission
Oregon

"Man reaches his highest estate only when he learns to make that which is useful, beautiful."

S. W. Baumiller
Roadside Development Dept.
State Roads Commission
Maryland

Maryland is well on its way in the development of her highways. By the end of next spring, we expect to have approximately thirty-five miles of dual highway completely landscaped.

Our right-of-way for dual highway is one hundred fifty feet. Wide right-of-ways is the first requisite toward beautiful highways, and the only assurance that the highways will be kept beautiful is to have roadside zoning laws to protect them. Although at present we do not have such laws, our garden clubs and civic organizations are working hard toward this objective. They were all alone at the start of this drive, but they are gaining the sympathy of the public at large by leaps and bounds. I predict that within the next two years we will have such roadside protection laws.

Our dual highways are being comprehensively landscaped, at the rate of approximately 20 miles per year. Ninety per cent of our plant material used is native and indigenous along the roadside on which it is to be planted.

Highway improvement cannot be regarded as complete until the natural beauty, marred in construction operations, has been fully restored and reasonably enhanced.

Albin Gries
Chief Landscape Engineer
Division of Highways
Illinois

Blue grass cuttings, obtained in the regular maintenance mowing operations on the highway right-of-way, are being utilized by the State of Illinois. These cuttings are placed on raw slopes, and provide a successful soil erosion mulch until the seed contained therein has germinated.

Frank Kelso
Superintendent, Highway Dept.
Wyoming

Snow Fence Trees

The tree planting has been fairly successful in some of the lower altitudes, although even up to this time very few of the plantings are out to such an extent as to act as snow fences. In the higher altitudes and in parts of the State where precipitation is less, we have lost quite a few trees.

In order for the trees to grow, it is necessary to give them constant maintenance, keep the weeds from grownig up around them, and maintain the fences to keep the stock off.

The best trees we now have are the Russian Olives, although the Caraganas have done fairly well.

We have a few western yellow pine which are thriving where we took precautions to protect them from the winter winds during the first few years of their growth.

W. W. Mack
Chief Engineer
State Highway Dept.
Delaware

We have been planting trees along the highways and rambler roses on our guard rail for a great many years.

It appears there is one thing which we overlooked in the early days, the hazard which trees planted close to the pavements of highways are to the motorist, particularly during the winter months when pavements are at times slippery and control of the car is made difficult. We feel that the question of safety is one which should be borne in mind in highway planting.

Our planting has been largely of the natural type, using native trees and shrubs, although with the limited rights-of-way in existence some years ago there was little that could be done except the planting of rows of trees on the extreme edge of the right-of-way.

Charles Rudd
Landscape Engineer
State Highway Commission
South Dakota

Limited rainfall and drouth periods in South Dakota necessitate the planting of hardy varieties of trees. Varieties that stand drouth well when once established are: American Elm, Green Ash, Hackberry, Red Cedar, Russian Olive, Cottonwood and Chinese Elm.

Cottonwood and Chinese Elm are fast growing trees and consequently considered short lived trees. At one time the Cottonwood was extensively planted, but sentiment was aroused to plant trees considered more permanent and the planting of Cottonwood was neglected. We believe, however, that the use of a considerable number of Cottonwood trees together with some of the longer lived varieties is very desirable. That tree makes a rapid growth and when it reaches maturity and dies, after a life period of 30 to 60 years, the other trees have grown to a size that is very satisfactory.

Opinion is divided on the desirability of Chinese Elm plantings. They grow well with a minimum of moisture. Growth is rapid but wind damage is occasionally severe. It has been noted that this variety when not trimmed high and limbs are allowed to grow quite low does not suffer wind damage as much as those trimmed high, and apparently stand the drouths better. One disadvantage encountered with Chinese Elm is that often a tree that appears very healthy dies for no apparent reason. In the fall the tree may look all right but in the next spring it may be completely dead. It is believed that in some fall seasons this variety goes into the winter with too much sap in the trunk and limbs especially if the tree is watered too late in the fall. One of our State institutions in the southeastern part of South Dakota where moisture conditions are generally satisfactory, reports that the Chinese Elm was the only tree that showed any loss by dying over the winter, and that it was caused by overwatering. This variety should be used in the same manner as Cottonwood, not planted exclusively, but planted with a number of other varieties.

Letters were received from the following, with best wishes and a promise to send material when available:

C. C. Newman
Landscape Engineer
State Highway Dept.
South Carolina

W. H. Marcellus
Roadside Improvement Engineer
Dept. of Public Works
Idaho

John M. Hall
Roadside Improvement Engineer
Division of Highways
Iowa

Maurice J. Day
Roadside Improvement Engineer
State Highway Commission
Oklahoma

A. W. Coleman
Landscape Engineer
Division of Highways
Vermont

H. J. Neale
Landscape Engineer
Department of Highways
Virginia

Carl Berggren
Special Design Engineer
Division of Highways
Montana

Dixie Tree Men in Gainesville

On the anniversary of the birthday of a famous American, George Washington, who maliciously, so it is alleged, cut down his father's cherry tree, a group interested in preserving trees will gather in Gainesville, Fla.

Hotel Thomas will be the headquarters for the Third Southern Shade Tree Conference, starting February 22 and running through the 24th. A splendid program has been arranged and includes several prominent scientists and arborists from north of the "line" as well as outstanding workers to the south.

Exhibitors will be given an important place by having the first evening to do their stuff. A tentative program reveals the interesting character of the meeting.

PROGRAM

THIRD SOUTHERN SHADE TREE CONFERENCE

UNIVERSITY OF FLORIDA

Gainesville, Florida

FEBRUARY 22-23-24, 1940

Headquarters: Hotel Thomas

OFFICERS

President: R. M. Weakley, Warren, Pennsylvania.

Vice-President: Mrs. H. M. Griffin, Daytona Beach, Florida.

Secretary-Treasurer: H. S. Newins, Gainesville, Florida.

THURSDAY, FEBRUARY 22

A. M.

8-12—Registration: Hotel Thomas. A full morning with the Shade Tree Exhibits at the Hotel.

Noon—Lunch.

P. M.—Florida Union Building, University of Florida.

1:30—Address of Welcome: Dr. J. J. Tigert, President of University of Florida.

1:45—Purpose and Aim of the Southern Shade Tree Conference: R. M. Weakley, Director, Howard Tree Research Laboratories, Warren, Pennsylvania.

2:00—Rusts of Southern Pines and Proposed Control: Dr. George F. Weber, Professor of Forest Pathology, University of Florida.

2:15—Discussion.

3:00—Insect Pests of Trees and Shrubs of the South and Their Control: Dr. J. J. Creighton, Professor of Entomology, University of Florida.

3:30—Discussion.

3:45—Anesthetizing Large Trees for Moving: Dr. Fred H. Heath, Professor of Chemistry, University of Florida.

4:00—Discussion.

4:15—Installation of Lightning Protection on Shade Trees of the South: Brooks Toler, State Forester of Alabama.

4:30—Discussion.

4:45—Shade Trees of Southern Florida: Dr. J. C. Gifford, Professor of Tropical Forestry, University of Miami, Miami, Florida.

5:00—Discussion.

Ev'n'g—Hotel Thomas.

7:30—An Evening with the Exhibitors. Each Exhibitor will be given an opportunity to discuss his exhibit.

FRIDAY, FEBRUARY 23

P. M.

9:00—Modern Methods of Shade Tree Fertilization Adaptable to the South: O. W. Spicer, F. A. Bartlett Tree Expert Company, Stamford, Conn.

R. M. Weakley (left) President, Third Western Shade Tree Conference; and (right) Dr. H. S. Newins, founder and Secretary-Treasurer

9:30—Discussion.

9:45—Fertilization of Southern Live Oaks: H. L. Jacobs, Davey Tree Expert Company, Kent, Ohio.

10:15—Discussion.

10:30—Spanish Moss Versus the Shade Tree in the Carolinas: Norman Armstrong, White Plains, New York.

10:45—Scientific Aspects of Tree Cavities: Dr. Rush P. Marshall, U. S. Department of Agriculture, Yale University, New Haven, Connecticut.

11:00—Tree Preservation—A Phase of Forestry: A. Robert Thompson, National Park Service, U. S. Department of the Interior, Washington, D. C.

Noon—Lunch at the University.

P. M.

1:30-5:30—Field Demonstrations of the Most Modern Equipment of the Latest Design will be held on the Campus just outside the Conference building.

7:00—Hotel Thomas. Business Meeting of the National Arborist Association. (Closed Meeting for Members Only).

9:00—Business Meeting of the Southern Shade Tree Conference.

SATURDAY, FEBRUARY 24

A. M.

9:00—The Planting, Care and Replacement of Street Trees: H. J. Howe, City Forester, Baltimore, Maryland.

9:15—Shade Trees of the South and the Landscape Architect: W. H. Reinsmith, Associate Landscape Architect, U. S. Forest Service, Atlanta, Ga.

9:30—Basic Principles of Shade Tree Pruning: H. C. Scott, Chattanooga, Tenn.

10:00—Effects of Cosmic Rays on Trees and Shrubs: Jack Gonzenbach, Louisville, Kentucky.

10:15—Discussion.

10:30—Shade Tree Problems that Confront the Landscape Architect and Nurseryman in Southern Florida: (Palm Beach or Miami Landscape Architect).

10:45—Discussion.

11:00—The Moving of Large Trees with Modern Equipment.

11:15—Discussion.

11:30—Salvage of Hurricane Damaged Shade Trees: W. O. Hollister, Davey Tree Expert Company, Kent, Ohio.

11:45—Discussion.

12:00—Adjournment.

An interesting program has been arranged for the ladies.

National Arborist Assn. Grows

The most important and encouraging sign of the aroused interest of Arborists the past year has been in the 40 per cent membership increase of the National Arborist Association.

Wes Hollister has performed valiantly as secretary and has been ably assisted by Pres. Norm Armstrong and other officers.

Several important things of vital interest to the profession are being worked out and will be made public shortly. This organization is an important one for Arborists and a much greater membership is anticipated in the coming year.

HEAT WAVE KILLS OAK MILDEW FUNGUS

Of particular interest to Southern Californians was the effect of the recent heat wave on the mildew of oak trees. Even in the coastal regions, where the disease is most severe, the high temperatures almost cleaned it up. In many trees the "witches brooms" were dessicated. Surprisingly, numerous cases have been observed where out of these dried up "witches brooms" new foliage is growing. In most instances these new leaves are not infected.—*Twigs.*

WEEPING BEECH

"*Fagus sylvatica,* the European beech, and its variety *heterophylla,* the fernleaf beech, seem to adapt themselves somewhat better than the American beech to general landscape planting. While the bark may not be quite so showy as that of the American beech, the foliage is more attractive. The fernleaf beech has attractive cut-leaved foliage and pleasing habit of growth. I believe if I could have only one shade tree on my lawn and it was located where it would do well, that plant would be the fernleaf beech.

—*L. C. Chadwick, "Nursery List."*

Scarlet Oak

(Quercus coccinea)

Edited by L. C. CHADWICK
Associate Professor of Horticulture
Ohio State University

The oaks constitute one of our most important groups of ornamental trees. They are strong, durable and relatively free from injurious insects and diseases. Since the advent of the Dutch Elm disease, phloem necrosis, and numerous other elm troubles, the oaks have increased in their importance and in some sections are being recommended instead of the elms.

Among the many oaks adapted to ornamental planting, the Scarlet Oak (*Quercus coccinea*) is considered one of the best. It is, however, probably no better than the Red, Pin, Willow, Texas Red, and White Oaks when these are used under the right conditions. The Scarlet Oak, a handsome tree with gradual spreading branches, forming a round topped head, is native from Maine to Florida, west to Minnesota and Missouri. It no doubt is adaptable to planting even outside of this area because reports have indicated that it does well in highway plantings in northern California. It prefers a relatively dry, acid, sandy soil but it is less particular to soil conditions than the Red Oak and some of the others.

The leaves are oblong or elliptical in shape, three to six inches long and straight across or broad wedge shaped at the base. The sinuses are deep, rounded or oval in shape, often closing considerable at the outer point. This is one of the main points to use in distinguishing this species from the Pin and Red Oaks which have a more open U-shaped sinus. The leaves are normally bright green turning a brilliant scarlet in the fall. The seven lobes, like all of those in the so-called black oak group, are bristle-tipped. The bark on the young twigs is smooth and light brown. On the older branches and trunk it is divided into ridges not so rough as those of the Black Oak or as flat and smooth as the plates on the Red Oak. The buds are dark reddish-brown, usually hairy above the middle. This characteristic also can be used as an identification point. The acorns, which take two years to mature, are about one-half to three-fourths inch long, reddish-brown, often striped and about one-third to one-half enclosed in the cup.

Above, Foliage of the Scarlet Oak

Below, Scarlet Oak trunk of a street tree in Pasadena, California, where the foliage develops to almost the same vivid colors as it does in its native habitat

A mature specimen of Scarlet Oak

The Scarlet Oak is readily transplanted. Among the most troublesome insects are the gypsy and brown-tail moths which can be controlled by stomach poisons, the golden oak scale, the obscure scale and the oak gall which can be controlled by dormant oil sprays, red spider controlled by wettable sulfur sprays, and the two lined chestnut borer which is very difficult to control. Badly infested trees should be removed and the vigor of the others increased. Occasionally the twig-pruner is serious. The recommendation here is to collect fallen twigs in winter and burn them. Most of these pests are not very serious in the midwest. Two diseases sometimes cause trouble, the leaf blotch disease and the shoe string root rot. The former can be kept under control by spraying with Bordeaux misture, two applications about two weeks apart, starting when the leaves are half size. General control of insects and diseases, increasing the vigor of the plant and improving the soil drainage will usually keep the root rot under control.

The species oaks are usually propagated by seed. Those of the Scarlet Oak may be sown in the fall or stratified in moist sand and peat at a temperature of 34 to 45 degrees F. over winter and sown the following spring.

The Scarlet Oak may be used both for street and lawn planting. According to records in New York City and elsewhere it even does fairly well in congested residential sections. Tree men could well use larger numbers of this oak in ornamental plantings.

Slope Rounding and Transition

By H. DANA BOWERS
Landscape Engineer
State Highway Department
Sacramento, Calif.

A mechanical method of slope rounding has been developed in District V of the Division of Highways, in connection with certain roadside development projects following construction which has proven very satisfactory; and is equally applicable to new construction.

By this method, practically all of the tedious and expensive hand shaping has been eliminated and rounding is accomplished by the use of a scraper attached to a track-layer type tractor.

Requirements: The requirements for satisfactory use of this method are that the top of slopes be of such a nature as to permit tractor operation, and that the soil be amenable to cutting and moving with the scraper.

Method: Rounding is accomplished by backing the scraper over the top of the cut slope, lowering the cutting edge, and making a series of diagonal cuts across the edge of slope, the depth of which may be controlled by the operator.

At the start of the operation, the cutting edge of the scraper lies in a plane with the slope. As the tractor progresses on a diagonal of approximately forty-five degrees to the edge of the slope, the upper wheel of the scraper reaches the summit, and the relative rate of elevation of the upper and lower sides of the scraper begins to change, resulting in a diagonal transition from the face of the cut to the top of slope.

Photo courtesy California Highway Dept.
Flattening Slopes with "Cat" and Special Scraper

The equipment is again backed, slightly overlapping the previous cut and the operation repeated. After the first slice has been made, the upper scraper wheel is rolling on the above mentioned transition, causing a smooth transverse rotation of the scraper's cutting edge as the equipment progresses, resulting in improved control.

For further rounding, a new series of cuts are made at approximately right angles to the first. This second operation increases the radius of rounding and results in a curve of improved smoothness due to the fact that both wheels of the scraper are this time rolling on the transition. These series of cuts may be continued, limited only by the ability of the tractor to operate on the rounded slope. Scraping may be supplemented by the use of a scarifier.

Should it be desirable to greatly increase the radius of rounding beyond the normal limits of safety for tractor operation, this may be accomplished by increasing the length of "hitch" or distance between tractor drawbar and the cutting edge of scraper.

In addition to the rounding described above, this method is used at the ends of cuts to develop transitions from existing slopes to normal ground.

Advantages: Slope rounding by hand methods, or by bulldozer, results in all trimmed material falling to the gutter where it must be rehandled and disposed of by trucks.

With the method heretofore described, there is a minimum of slough to be handled due to the fact that practically all material removed in the rounding operation is drawn to the top of cut where it may be drifted into surface irregularities by the same equipment, greatly improving the profile line of cut.

The National Roadside Program

(*Continued from page* 7)

the majority of the public is more fully aware of the potentialities of *orderly* roadside development—for public understanding of the roadside problem is the essence of its solution.

The potential place occupied by roadsides as recreational and esthetic features is rarely appreciated, although the desirability of attractive roadsides and safe highways is frequently conceded. Most of us look at only part of the picture, and seldom consider the roadside situation *as a whole.*

ROADSIDE PROTECTION ESSENTIAL TO SAFE, ATTRACTIVELY PLANTED HI-WAYS

As already stated, without the proper foundation width for tree-growth requirements, the planting and establishment and maintenance of healthy trees along highway borders is seriously handicapped. Highway authorities have attempted to solve these growing problems within the existing right-of-way limits, but lacking the essential marginal control of highway borders, they have sometimes been unable to prevent hindrances to highway traffic from undesirable private property developments and to prevent injury to existing and planted trees within such restricted right-of-way limits.

The pressing need for a more positive protection of highway borders through the better correlation of the design of highway entrances and adjacent land uses was evidenced at the Annual Convention of the American Association of State Highway Officials at Dallas, Texas, in 1938, and at Richmond, Virginia, in 1939, when resolutions were adopted suggesting changes in State laws to provide roadway builders with more flexibility in planning and construction procedure in order to give proper recognition to changed trends in highway usage and motor transportation. Among these proposals was the "authority to acquire sufficient widths of right-of-way to protect the public investment in the highways and to reduce hazards;" and "authority to make and enforce regulations controlling the uses of private property abutting on State highways."

With such a national objective in building the foundation for the coming American highway system, who can measure the potentialities of highway landscape development? With such a foundation for the tremendous highway mileages that will be built in the future, the opportunities for tree-planting will increase. The coordinated development of roadbed, roadside and adjacent lands will eliminate many of the present limitations to tree-green highways in this country. Each individual reader must judge for himself the potentialities and possibilities of such a fundamental American program, indicative of the increased part to be played by highway roadsides in the future.

THRU *the* MICROSCOPE

By DR. C. J. HUMPHREY

MODIFICATION OF DUTCH ELM DISEASE QUARANTINE (1): The present regulated area comprises the northern half of New Jersey, the southeastern tip of New York, the southwestern corner of Connecticut, the western end of Long Island, and a narrow strip in eastern Pennsylvania. The disease, however, exists sporadically as far west as Indianapolis and as far south as Norfolk, Virginia. Restrictions are in force to limit the movement of elm material from nonregulated areas through regulated to the winter months when the elm beetles are not in flight.

PERSIMMON WILT (2): This virulent disease so destructive in the southeastern states was found at Dallas, Texas, in June, attacking young native trees. This is a marked westward extension.

PHLOEM NECROSIS OF ELM: This virus disease, which affects the roots as well as the crown, was first reported in 1938 from the central and lower Ohio river watershed, although it had been present there, as well as in southwestern Indiana and northern Kentucky, for several years previous to this. At Chillicothe, Ohio, it reached epidemic proportions in 1935, 50 per cent of the city's trees dying in 1936 and 1937, the affected trees being killed in from three to 36 months. (3). The characteristics of the disease have already been reviewed by Tilford in this magazine. (4). It has been present near Lexington for possibly over 10 years. On one estate near that city 50 per cent of the elms are already killed, the disease attacking only 5 to 15 year transplants imported from out of state, the native elms being so far unaffected. These older trees may have possibly developed a certain resistance. (5). For several years also the disease has rapidly killed elms in southwestern West Virginia, where it is reported all ages are susceptible and even the largest trees may be killed in a season. The trouble is associated with an insect, as most virus diseases are, and since the killed trees breed the elm beetle, which spreads the deadly Dutch Elm Disease, this is also arousing considerable concern from that standpoint. (6).

LESIONS ON QUERCUS LAURIFOLIA (7) closely resembling a bark disease of Citrus known as "leprosis," have recently been noted in Florida. This citrus disease occurs in South America and Florida and is caused by a virus, which is possibly spread by a mite. The laurel oak infections were in close proximity to orange groves, often growing near bodies of water.

A new BACTERIAL LEAF SPOT OF MAPLE (8) caused by Phytomonas aceris n. sp. was observed on seedlings of *Acer Macrophyllum* in a Berkeley, California, nursery in 1937, during cool damp weather in spring. The leaf spots vary from the size of a pin point to one-fourth inch. At first they are surrounded by a yellow zone, later turning dark brown or black. If the disease is very serious cankers may develop on the petioles and the leaves may fall. The malady is closely related to a similar disease of *A. trifidum* in Japan. *Acer circinatum, A. negundo,* and *A. palmatum* are also susceptible.

A study has just been made on the effect of sea spray deposits on the sport germination and mycelial growth of the CYPRESS CANKER fungus (9) in California, caused by *Coryneum cardinale.* Salt deposits on old dead bark of *Cupressus macrocarpa* along the ocean front amounted only to about one-third gram per 100 sq. centimenters, and far less than this on young bark and foliage. The fungus will grow, however, on 12-14 per cent sodium chloride (common salt) and the spores will germinate after soaking for five days in a saturated solution. Hence the conclusion is reached that natural deposits of sea spray offer no appreciable protection against infection.

The well-known BLIGHT OF JUNIPERUS VIRGINIANA (10) caused by *Phomopsis juniperovora* occasioned severe losses in Federal and State nurseries in the southeastern and central states in 1937 and 1938. The disease was, with a single exception, originally found on eastern nursery stock, but it was assumed that wildings often served as a source of infection to the nursery plants. The fungus has now been isolated from 2-20 year old natural reproduction in North Carolina and Tennessee, some from the vicinity of nurseries, others eight or more miles away. Fertilizing nursery trees either with ammonium sulphate or 4-10-4 commercial fertilizer stimulated the plants so that much more severe losses occurred. Control by Bordeaux spray and rogueing cost 40 cents per M at one nursery, but at others the practice was prohibitive. In epidemic form the practical advantage of these measures are said to be dubious.

PHAEOCRYPTOPUS GAUMANNI (*Adelopus balsamicola* (Peck) ON DOUGLAS FIR (11) is known to have been present in Connecticut since 1929, although it was reported and described by the New York State botanist much earlier and is well-known as a European disease. The fungus acts slowly, producing a yellowish color to the leaves and causing heavy defoliation which gradually devitalizes the trees over a period of years, and finally kills them.

CONTROL OF ARMILLARIA ROOT ROT (12) is still under investigation at the University of California. It has been found that soil texture has little influence on the effectiveness of carbon disulphide in sterilizing infected soil. Forty-five cubic centimeters inserted in the soil to a depth of 8 or 9 inches, in holes staggered at 18 inch intervals, will kill the fungus to a depth of 5 feet, and possibly more. Where effectively applied, 30 to 60 days are required before the fungus is killed in all roots.

TEXAS ROOT ROT which is so prevalent on various plants in the Southwest, but not in southern California, is still being closely investigated from different angles. On pecan roots extensive injury is present even at the time of the earliest symptoms of the disease. The trees do not resist invasion but may survive for as long as two years by means of shallow roots that have escaped. All roots above one-eighth inch can readily be infected and the fungus can spread along them from 0.6 to 0.8 inch a day during July and August. Initial penetration is most rapid through the lenticels, but also occurs where the lateral roots emerge, or through normal breaks in the bark. Chemical fertilization produces abundant adventitious roots, and these are a major factor in the recovery of trees under treatment (13). In Arizona intercropping of pecan groves with alfalfa, a very susceptible host, has caused nearly all of the serious outbreaks. One 40-acre grove so interplanted on an infected soil showed 3.4 times as many diseased pecans as a similar grove not interplanted, but on even more severely infected soil. The substitution of certain immune forage grasses for alfalfa shows great promise in reducing the severity of the root rot (14).

DAMPING-OFF CONTROL (15): The New York Experiment Station at Geneva has recently published a circular giving the gist of nine years' research on this subject, the details of which may be found in Bulletin 683. Seed treatments, preferably dusts, are discussed and report is given on the use of red copper oxide, zinc oxide and semesan on 105 plant species, including many ornamentals. Seed treatment, however, is not adequate in all cases and then soil sterilization or pasteurization with steam, dry heat, hot water, or chemicals must be resorted to. The chemicals discussed for this purpose are zinc oxide, mercury compounds, potassium permanganate, sulphuric acid, and aluminum sulphate, while red copper oxide is given consideration as a spray. Suitable cultural practices are also emphasized.

CONTROL OF SHADE TREE BORERS (16) is the subject of a recent circular from the Oklahoma Experiment Station at Stillwater. Fifteen of the more common and injurious insects are discussed, with particular stress on the flat-headed apple tree borer. Directions for control by the use of carbon disulphide, a poison oil spray containing arsenite or arsenate of soda, and paradichlorobenzine in cottonseed oil are given.

(1) U. S. Bur. Ent. & Plant Quar. 1939; (2) Dunlap, Plant Disease Reporter 23, No. 21, p. 347. 1939; (3) Swingle, Phytopathology 28, No. 10, p. 757. 1938; (4) Trees Mag. 2, No. 2, p. 11. 1939; (5) Valleau, Pl. Dis. Rep. 23, No. 18, p. 300. 1939; (6) Leach, Pl. Dis. Rep. 23, No. 18, p. 300. 1939; (7) Fawcett & Rhoads, Phytopath. 29, No. 10, p. 907. 1939; (8) Ark, Phytopath. 29, No. 11, p. 968. 1939; (9) Dimock, Phytopath. 29, No. 9, p. 823. 1939; (10) Davis & Latham, Phytopath. 28, No. 11, p. 991. 1939; (11) McCormick, Pl. Dis. Rep. 23, No. 22, p. 368. 1939; (12) Thomas & Lawyer, Phytopath. 29, No. 9, p. 827. 1939; (13) Brinkerhoff, Phytopath. 29, No. 9, p. 823. 1939. (14) Streets, Phytopath. 29, No. 9, p. 827. 1939. (15) Horsfall, Circular 186, 1939. (16) Fenton, Circular 84, 1939.

Sub-Area Water For Winter

Trees and shrubs need a generous supply of moisture during the fall and winter months as well as other seasons, said C. N. Woods, regional forester, U. S. Forest Service, Ogden, Utah, replying to inquiries about possible effects of the present dry period on ornamental plantings in the State.

"It is highly essential that shrubs and evergreens, especially the latter, go into the winter season with a good supply of soil moisture available to them," Mr. Woods said. "Loss of water from the stem portions of trees and shrubs continues throughout the year. Although in deciduous species the loss is greatly reduced with the fall of leaves, the evergreens—cedars, pines, spruces and firs—commonly used for ornamental purposes have no such form of protection and continue to lose moisture at a fairly rapid rate through the winter.

"It is important to get water down to the deeper soil at this time of the year because top soil layers are frequently frozen and the plant root system must depend on water supplies in the unfrozen lower depths."

Because of the unusually dry fall and early winter conditions now prevailing, watering of trees and shrubs particularly needs attention, Mr. Woods pointed out. Lack of moisture in evergreens is frequently reflected by a fading yellowish tinge in the needles.

Types of Leaf Diseases

EDITOR'S NOTE: This is an excerpt from a paper by Dr. J. C. Carter, Assistant Botanist, Illinois State Natural History Survey, at the mid-winter Arboricultural Conference (Jan., 1939) of the Midwest Institute of Park Executives. Other excerpts from this paper will be published in later issues.

Tree diseases may be divided into leaf diseases, wilt, canker, die-back, and stag-head. These types of diseases are not easily differentiated, because one type may gradually develop into a branch canker. A canker that girdles a branch develops into a die-back, and die-back of the upper branches or the development of antlers in the top of a tree is called stag-head.

LEAF DISEASES

Leaf diseases of trees are classed as blight, blister, blotch, curl, leaf rust, scorch, spot, mildew, anthracnose and needle cast diseases. Some of the more important leaf diseases of hardwoods are listed below:

Note: In each of the following cases, the host tree is named first, with the fungus affectations following.

Leaf Blister

Birch: Taphrina betulina, taphrina bacteriosperma (red leaf blister), taphrina carnea (red leaf blister), taphrina flava (yellow leaf blister).
California Buckeye: Taphrina aesculi.
Elm: Taphrina ulmi.
Golden Chiquapin: Taphrina castanopsidis.
Hop-hornbeam: Taphrina virginica.
Maple: Taphrina (several species).
Oak: Taphrina coerulescens.
Poplar: Taphrina aurea.
Red Alder: Taphrina tosquinetii.
Wild Cherry: Taphrina farlowii.

Leaf Spot

Elm: Gnomonia ulmea, gloeosporium ulmicolum.
American Chestnut: Monochaetia desmazierii.
Hickory: Monochaetia desmazierii.
Oak: Monochaetia desmazierii.
Red Maple: Monochaetia desmazierii.
Winged Elm: Monochaetia desmazierii.
Witch-hazel: Monochaetia desmazierii.
Sugar Maple: Cristulariella depraedens.
Silver Maple: Cristulariella depraedens.
Honey Locust: Linospera gleditsiae.
Red Mulberry: Mycosphaerella mori.

Small Leaf Spot

American Chestnut: Marssonia ochroleuca.

Anthracnose or Leaf Spot and Twig Blight

Oak: Gnomonia veneta.
Sycamore: Gnomonia veneta.
River Birch: Gnomonia betularum.

Leaf Blotch

Horse Chestnut: Guignardia aesculi.

Tar Spot

Maple: Rhytisma acerinum, rhytisma punctatum.
Willow: Rhytisma salicinum.

Ink Spot

Aspen: Sclerotinia bifrons.

Powdery Mildew

Alder: Erysiphe aggregata.
American Elm: Uncinula macrospora.
Basswood: Uncinula clintonii.
Buckeye: Uncinula flexuosa.
Maple: Uncinula circinata.
Oak: Ephaerotheca lanestris, Erysiphe trina.
Oaks and other trees: Microsphaera alni.
Poplar: Uncinula salicis.
Willow: Uncinula salicis.
Various tree species: Phyllactinia corylea.

Rust

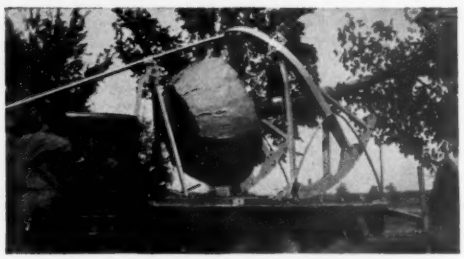
Ash and Spartina: Puccinia peridermiospora.
Birch and Larch: Melampsoridium betulinum.
Oak and Pine: Cronartium quercuum.
Oak and Pine: Cronartium fusiforme.
Poplar and Hemlock: Melampsora abietis-canadensis.
Poplar and Larch: Melampsora medusae.
Poplar: Melampsora occidentalis.
Poplar and Douglas Fir: Melompsora albertensis.
Willow and Balsam Fir: Melampsora abieticapraearum.
Willow and Larch: Melampsora bigelowii.
Willow and Currant: Melampsora ribesii-purpureae.
Willow and Saxifrage: Melampsora artica.

The recommended control for the leaf blister diseases is to spray the trees with Bordeaux mixture in early spring, just before the leaves appear.

To control leaf spots, leaf blotches, tar spots and ink spot, the diseased leaves should be removed and burned in the fall. The trees should be sprayed; the first application when the leaves are unfolding, the second when the leaves are full-sized, and the third approximately two weeks after the second application.

Anthracnose and some of the leaf spot and leaf blotch diseases are not only leaf diseases but also develop into twig die-back and twig cankers. The disease-producing fungi overwinter in the infected wood and fallen leaves. To control these diseases that affect both the leaves and twigs, the trees should receive three to four applications of Bordeaux misture. The first spray application should be made when the first green color appears at the beginning of the regular spring growth, the second when the leaves are unfolding, the third when the leaves are full-sized, and the fourth approximately two weeks after the third application. In addition to this spray program the dead and cankerous twigs should be pruned and burned in the spring and the fallen leaves should be removed and burned in the fall.

Powdery mildew is controlled by dusting or spraying the infected trees with sulphur and by the removal and destruction of dead leaves. Dusting should be done in early morning while the foliage is still damp.



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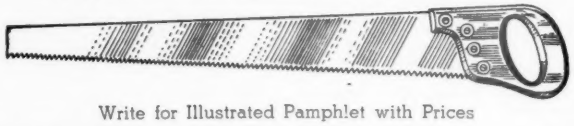

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Authors and Books

JAC L. GUBBELS

Jac L. Gubbels was born in Holland 43 years ago, and received his early education there and in Germany. About the beginning of the world war went to work for a British company in Sumatra, Dutch East Indies, remaining there six years. In 1923 he came to the United States, spending the first ten months in Michigan, thence to Denver, where he maintained a partnership landscape office for three years. Then to Houston, Texas, where he opened an office for two years. In 1928 was engaged by the City of Austin, Texas, to undertake the spending of a $750,000 bond issue for the development of boulevards, playgrounds and a park system. On April 1, 1933, was appointed to head a Landscape Division of the Texas State Highway Dept., which position he still holds.

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TREE PRESERVATION BULLETINS: A. Robert Thompson, Forester, National Park Service. Re-issue.

The demand for the series of pamphlets on shade tree care issued by the National Park Service and known as the Tree Preservation Bulletins was so heavy that the original printing was soon exhausted and many orders could not be filled. We are now informed that a new printing has been made and that a complete stock now is available for sale at 10 cents per copy.

Orders for the following bulletins, accompanied by cash, check or money order, should be sent to the Superintendent of Documents, Washington, D. C. Stamps cannot be accepted.

APPLIED SILVICULTURE IN THE UNITED STATES: R. H. Westveld. John Wiley & Sons, Inc., New York. 567 pp. $5.00.

In this important addition to Forestry literature the author has deviated from the normal and has divided the United States into eighteen regions, and has further subdivided with many types. Originally published as a lithoprinted book, this treatise is not new, but many valuable additions have been made. Each region is treated in detail as follows by heading: Location and Land Ownership; Physiographic Features; Climatic Features. Historical, Development and Lumbering; Effect of Past Practices; The Forests and Their Management. Then to the composition and character of the Forest.

THE FOREST MANAGER: Dr. Karl Dannecker, American Forestry Ass'n., Washington, D. C. 172 pp. $2.00. American Edition.

The woodland owner in America will find in this splendid book a direct answer to many of his problems. There is of course a discussion on the value of the forest; forest soil and its treatment; silvicultural systems; systems of management and so through the many phases of technique necessary to the successful solution of many problems. One is impressed strongly with the fact that this is not one man's experience, but the results of centuries of management in a country that has long applied systematic management to its forests.

SECHRIST'S FOREST MANUAL: W. C. Sechrist. The Craft Press, Inc., Fayetteville, Pa. 1939. 128 pp. $1.50.

A handy, vest pocket short cut that can be used every day in the field. In the chapter on "Telephone Lines" under "Spacing of Tie Trees" he wastes no words—"Open country, light snow 130-160 ft." "Do not use copper wire on tree lines," etc. Is full of charts and tables such as this, "Table for conversion of inches and sixteenths into decimals of a foot." One cannot remember everything and this is full of hints that will recall forgotten data.

PROCEEDINGS FIFTEENTH NATIONAL SHADE TREE CONFERENCE: Order from Dr. L. C. Chadwick, Ohio State University, Columbus, Ohio. 264 pp. $3.00.

Complete transcripts of all papers and discussions given at the annual conference in New York, August 22-24, 1939. The latest information on Tree Preservation practice from both scientist and arborist. These proceedings are indispensable to Arborists, Park Departments, Foresters and anyone engaged in ornamental tree work. We are told the supply is limited and you are urged to order early.

TREES OF THE SOUTH: Charlotte Hilton Green. University of North Carolina Press, Chapel Hill, N. C. 1939. 551 pp. $2.50.

A wealth of research has been carefully brought together in this splendid volume to give the tree lover, forester, arborist, or park man one of the most enjoyable and enlightening reading companions. By all means add this book to your collection. It is profusely illustrated with splendid photographs showing the entire tree and closeups of fruit, flower, foliage and trunk. The style is extremely pleasing and the author is to be highly commended for a splendid contribution to tree literature.

FLOWERING SHRUBS OF CALIFORNIA: Lester Rountree. Stanford University Press, Palo Alto, Calif. 317 pp. $3.00.

Many exciting, adventurous journeys into the mountains, chaparral and deserts of California have gone into the accumulation of data contained in this splendid work by a real authority on California flora. California has given the garden world many grand plants, and in this book the author gives very specific directions for their culture. The author is a bit severe in her criticism of roadside planting in the state, and could have been more specific in placing blame for narrow rights-of-way. It is refreshing to see the native plants so capable praised.

PARTNER OF NATURE: Luther Burbank. Edited by Wilbur Hall. D. Appleton-Century Co., Inc., New York. 315 pp. $3.00.

The amazing capacity for work and large scale experiments that characterized the work and life of Luther Burbank is told in this very interesting book. Although published many years after the death of the famed horticulturist, the material is beautifully put together by Mr. Hall, a co-worker of Burbank's for years. An interesting feature is the time to time mention in Burbank's notes on possible future experiments in hybridizing that

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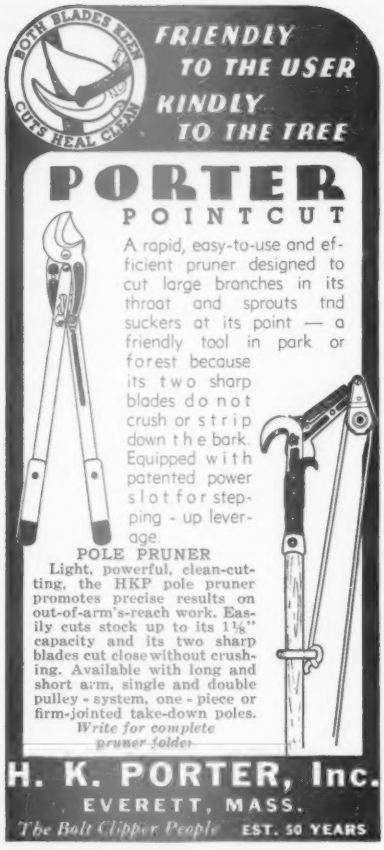
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WOODCRAFT: Bernard S. Mason. A. S. Barnes & Co., New York. 580 pp. $2.75.

The forester; outdoor man who vacations in the woods or the wood hobbyist will find real enjoyment and plenty of new camp tricks in this fine looking book. The contents is divided in three parts: Campcraft, Woodcraft and Crafts of the Woods. Father or son will like it.

MAGIC GARDENS: Rosetta E. Clarkson. The Macmillan Company, New York. 369 pp. $3.00.

For some reason or other herbs have always intrigued me and an herb garden always seemed like it might be the ultimate in interest as well as utility. Until "Magic Gardens," which is a modern Chronicle of Herbs and Savory Seeds, came along, I had never given thought to going into the literature to realize my sub-conscious desire, being busy with this and that. But the interesting chronology that Mrs. Clarkson has brought together from the middle centuries and the fascinating presentation makes this book a charming companion.

NEW PRONOUNCING DICTIONARY OF PLANT NAMES: Florist's Publishing Company, 508 So. Dearborn St., Chicago, Ill. Twenty-five cents.

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To be reviewed in next issue:

FEARSOME CRITTERS: H. H. Tryon. Idlewild Press, Cornwall, N. Y. $2.00.

RAINFALL AND TREE GROWTH IN THE GREAT BASIN: Ernst Antevs. American Geographical Society, New York. $3.00.

Divided Highways

(*Continued from page* 8)

is very pleasing and can be effective if brought out to the ends of the slope. Slope plantings should be considered from the maintenance point of view and material should be used that will spread over the area by itself. The root system is the workshop that builds up a force to retard erosion and those plants with a spreading root system and low growing are the most important to consider. Many combinations can be developed to bring out the effect desired, such as sumac and sweetfern, bayberry and bearberry. The latter two will grow well in sandy soil and have the natural habit necessary to make them desirable as slope covers. They do not require the moisture that elderberry and highbush blueberry need. These may be placed in irregular groups with hardhack as a combination. Through woodland areas, we may develop a border or undergrowth of shade loving varieties, such as laurel, azalea and inkberry. These make a natural undergrowth where it exists in the background.

To make the highway look pleasing, advantage should be taken of the roadside views, making them a part of the landscape design. These are important because you have an opportunity to bring out the characteristics of the landscape. Many scenes native to the State should be left unscreened and definite views maintained. Waysides and picnic areas should be constructed at these points, if they cause enough interest. The well-designed highway of today must have these features, if we are to take care of the motorist properly. These areas must not be too large, but comfortabel and safe to enter and leave.

The highway, when completed, should look as though very little natural growth was disturbed and the median strip kept low. The roadsides, with the large foliage and tree effects, can be made a part of the landscape, with trees around the structures and ground cover on the slopes.

I think that Wilbur Simonson stated it well when he said, "A well balanced design is the most economical from the long-range point of view. The foundation of well balanced design is an adequate width of right-of-way, with road bed, roadside, and adjacent lands all united in proper relation."

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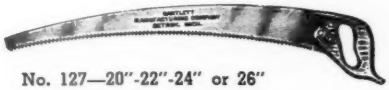

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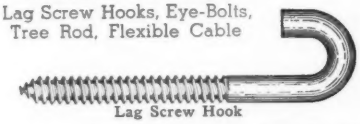

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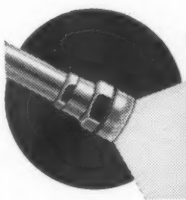

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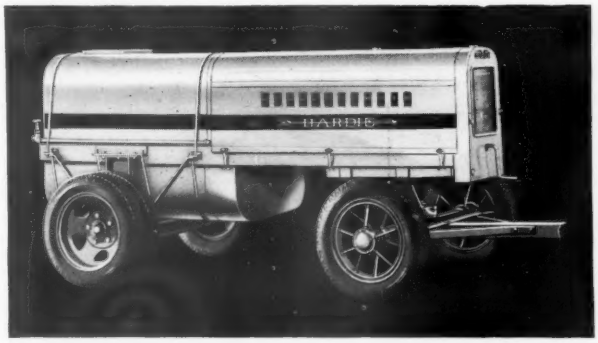

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Tree planted — 2-year-old Jacaranda mimosaefolia, with 26" Airqua Tree Bell. Picture taken from distance of 3 ft. Note lath stake in both pictures.

SEPTEMBER 25, 1939

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